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INSTALLING A COPY OF THE ARPA/DMA IMAGE UNDERSTANDING TESTBED AT THE U. S. ARMY ENGINEER TOPOGRAPHIC LABORATORIES

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By: Andrew J. Hanson, Senior Computer Scientist
Project Leader
(415) 859-4395

Artificial Intelligence Center
Computer Science and Technology Division

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Defense Advanced Research Projects Agency
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Arlington, Virginia 22209

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SUMMARY

The principal objective of this effort is to establish a functional copy of the SRI Image Understanding (IU) Testbed system of hardware and software at the U. S. Army Engineer Topographic Laboratories (ETL) Research Institute at Fort Belvoir, Virginia. Major tasks to date have consisted of purchasing the required hardware and arranging for its installation at ETL, arranging for licensing of Testbed supporting software systems, assisting with final hardware installation and testing, and installing Testbed software systems. Future tasks will include acquisition of additional hardware, advising ETL on system development and maintenance issues, and developing support software to enhance the overall capabilities of the system. The main beneficial result of this effort will be the transfer to ETL of a large body of research technology carried out by SRI and numerous other contributors to the DARPA Image Understanding research program.

I INTRODUCTION

The ARPA/DMA Image Understanding Testbed system was established at SRI to provide a framework for evaluating and demonstrating the applicability of IU research results to automated cartography. A number of software systems were contributed to the Testbed by participants in the DARPA IU research program; these systems were adapted to the SRI environment and numerous additional utilities were generated at SRI specifically for the Testbed. These efforts have resulted in a system that allows the transfer of research technology to other sites for the purpose of evaluation.

The objective of installing a copy of the IU Testbed at ETL is to carry out such a transfer of technology. The acquisition of a Testbed copy will significantly enhance the capabilities of ETL for evaluating and adapting Testbed software and Testbed environment features to specific problem areas. ETL personnel will be able to work directly with contributed IU research software and to study the implications of employing such techniques for cartographic tasks. In addition, the close association of ETL with the cartographic-production branches of DMA will enable them to cooperate closely in analyzing the application and user interface requirements that are representative of DMA's needs.

II PROGRESS

As of the date of this report, the installation of an IU Testbed copy at ETL is complete. All standard Testbed software and all critical hardware elements are in place and functional. The installation was carried out during a site visit to ETL by the SRI project leader, Andrew Hanson, from May 9 through May 13, 1983.

Since the installation of the system, we have kept in frequent contact with ETL personnel. Advice and guidance has been provided on a wide variety of hardware and software maintenance issues. We have also provided additional instruction on the use of the software systems when needed.

We have assisted ETL in obtaining hardware and fulfilling administrative requirements for becoming a node on the ARPANET. Installation of ETL as an ARPANET or MILNET node is expected soon.

The following items of equipment have been purchased or ordered for the project as of this date:

* VAX 11/780 computer system (installed)
* Grinnell GMR-275 image processing system (installed)
* 19" color monitor, 15" monochrome monitor, 12" monochrome monitor (installed)
* Versatec V-80 printer/plotter and support stand (installed)
* Datamedia computer terminals (installed)
* Optronics C-4100 color film scanner (installed)
* Additional disk drive system (partially received, not installed)
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* One digitizing tablet with special PROM for interactive functions (on order)
* Two additional 12" monochrome monitors for individual workstations (on order).

In addition, the following one-year service contracts have been acquired:

* VAX 11/780 system hardware maintenance contract
* VAX 11/780 system software maintenance contract
* Versatec V-80 hardware maintenance contract.

III PLANS

As desired by ETL, we shall continue to provide advice and conduct tutorials on the management and use of the system. We shall also continue to discuss the areas in which ETL needs further support and software development in order to take full advantage of the system. We will continue to plan for future support activities and tasks to be incorporated into the ETL Testbed copy effort.

Additional analysis is in progress to select and order the final set of hardware enhancements to the basic ETL Testbed system. In particular, we plan to add the following equipment items to the ETL system:

* Additional pointing devices for use with interactive graphics programs.
* Additional monitors to enable remote use and sharing of the system graphics capabilities.
* A video crossbar to support dynamic sharing of graphics resources.
* A film recorder to record the results of image processing on slides and other photographic media.

We also intend to investigate several types of stereographic display systems for possible inclusion in the SRI Testbed; if a suitable system is found, we will consult with ETL about the desirability of obtaining a similar system for the ETL Testbed.

Specific software enhancement tasks we plan to undertake in the course of the project include the following:

* Addition of interactive graphics utilities using interactive pointing devices.
* Addition of an enhanced IP/TCP network system including support for the ARPANET and other local-area networks such as LISP Machine ETHERNET networks.

* Upgrading the graphics access system to a device-independent protocol, so that Testbed applications programs may be run on devices other than the Grinnell.

* Development of a compatible LISP graphics protocol that can be used either with FRANZ LISP on the VAX with the proposed device-independent graphics system, or with the SRI LISP Machine systems; note that a LISP Machine system will be incorporated into the ETL Testbed system at a later time as part of a previous SRI DARPA contract.

* Addition of utilities for manipulating images and graphic representations.

* Incorporation of Berkeley UNIX 4.2BSD software into the Testbed system when it becomes available.

SRI plans to continue its close contact with the ETL Testbed copy system to facilitate the transfer of machine vision technology. As a result, ETL will be able to evaluate and experiment with current IU research concepts in an efficient manner.